

#### Abstract of the Disclosure

The invention relates to a spatially encoded polymer matrix in the form of a bead or a granule for combinatorial solid phase synthesis, assaying, functional proteomics and diagnostic use. Compositions of such beads or granules are also provided. Each beaded polymer matrix of the composition comprises a plurality of spatially immobilised particles. The spatial immobilisation of the particles confers on each beaded polymer matrix a "fingerprint" which enables identification of unique beads in a population of beads. The unique identification of individual beads makes it possible to perform combinatorial chemistry strategies while logging individual chemical transformation. Also provided are methods for detection of relative positions in space of particles, methods for generating matrices, methods for distance matrix determination, methods for identifying individual matrices and devices for recording and storing images of matrices.

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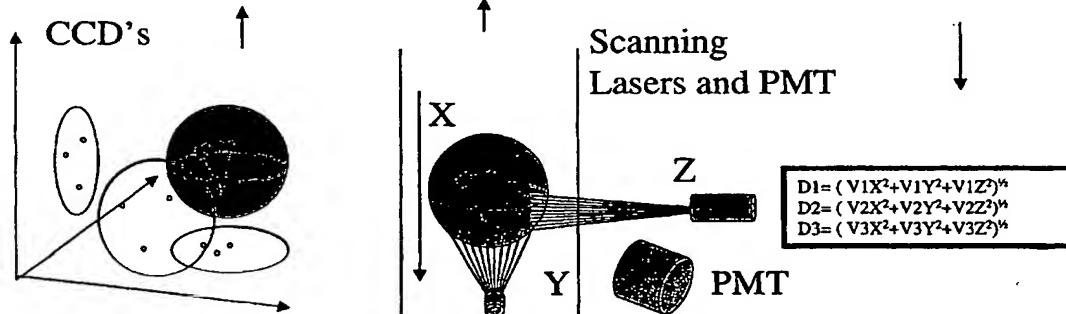
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- (71) Applicant (for all designated States except US): CARLSBERG A/S [DK/DK]; Gamle Carlsberg Vej 10, DK-2500 Valby (DK).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): CHRISTENSEN, Søren, Flygenring [DK/DK]; Frederiksberg Bredegade 7B, 1.tv., DK-2000 Frederiksberg (DK). TRUELSEN, Jens, Høg [DK/DK]; Strandgade 47 1.tv., DK-3000 Elsinore (DK). MELDAL, Morten [DK/DK]; Mosesvinget 78, DK-2400 Copenhagen NV (DK). MICHAEL, Roice [DK/DK]; Nitivej 11, DK-2000 Frederiksberg C (DK). JOHANNSEN, Ib [DK/DK]; Munkevej 24, DK-3500 Værloese (DK).
- (74) Agent: HØIBERG A/S; St. Kongensgade 59A, DK-1264 Copenhagen K (DK).
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(54) Title: SPATIALLY ENCODED POLYMER MATRIX

**Spatial encoding of beads**

$$\begin{array}{l} Y_1, Z_1; Y_2, Z_2; Y_3, Z_3 \\ X_1, Z_1; X_2, Z_2; X_3, Z_3 \\ X_1, Y_1; X_2, Y_2; X_3, Y_3 \end{array} \longrightarrow \begin{array}{l} X_1, Y_1, Z_1 \\ X_2, Y_2, Z_2 \\ X_3, Y_3, Z_3 \end{array} \longrightarrow \begin{array}{l} V_1 = (V_1X, V_1Y, V_1Z) = X_1-X_2, Y_1-Y_2, Z_1-Z_2 \\ V_2 = (V_2X, V_2Y, V_2Z) = X_1-X_3, Y_1-Y_3, Z_1-Z_3 \\ V_3 = (V_2X, V_2Y, V_2Z) = X_2-X_3, Y_2-Y_3, Z_2-Z_3 \end{array}$$



(57) **Abstract:** The invention relates to a spatially encoded polymer matrix in the form of a bead or a granule for combinatorial solid phase synthesis, assaying, functional proteomics and diagnostic use. Compositions of such beads or granules are also provided. Each beaded polymer matrix of the composition comprises a plurality of spatially immobilised particles. The spatial immobilisation of the particles confers on each beaded polymer matrix a "fingerprint" which enables identification of unique beads in a population of beads. The unique identification of individual beads makes it possible to perform combinatorial chemistry strategies while logging individual chemical transformation. Also provided are methods for detection of relative positions in space of particles, methods for generating matrices, methods for distance matrix determination, methods for identifying individual matrices and devices for recording and storing images of matrices.

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